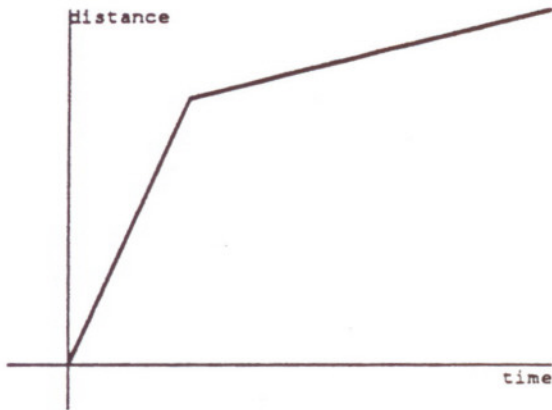
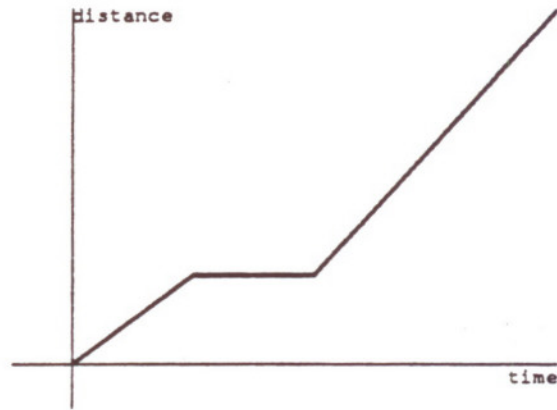


Biking to school¹

Terry usually rides a bicycle to school. Below are four graphs and three explanations. Match each explanation with a graph, and write an explanation for the remaining graph.



A



B



C



D

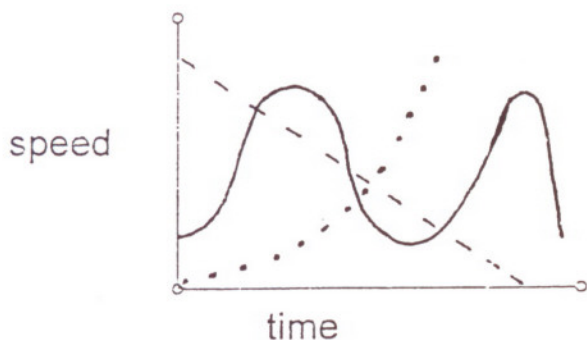
1. "I had just left home when I realized we have gym today, and I had forgotten my gym clothes. So I went back home and then I had to hurry to be on time."
2. "I always start off very calmly. After a while I speed up, because I don't like to be late."
3. "I went on my motor bike this morning, very quickly. After a while, I ran out of gas. I had to walk the rest of the way and was just on time."
- 4.

¹ Adapted from Neil Davidson, ed., *Cooperative Learning in Mathematics: A Handbook for Teachers*, Addison-Wesley, 1990.

In each instance below, identify the graph of the given condition(s):

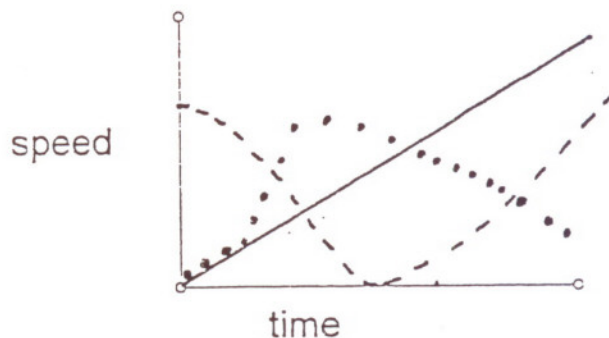
1. A marble rolling to a stop.

a) — — — b) c) ———



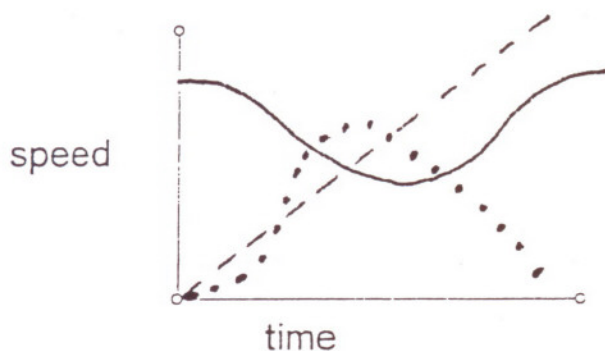
2. A car stops at a stop sign, then moves on.

a) — — — b) c) ———



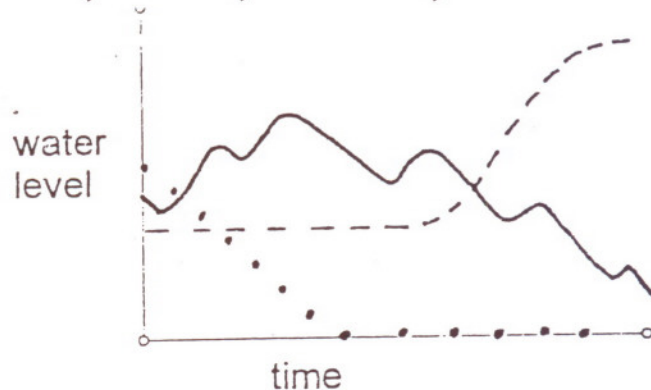
3. A car slowing down, then speeding up.

a) — — — b) c) ———



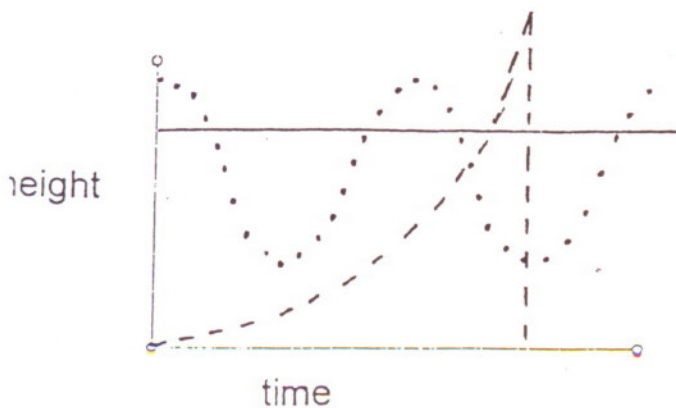
4. Water level of a river through seasonal rains and dry spells.

a) — — — b) c) ———



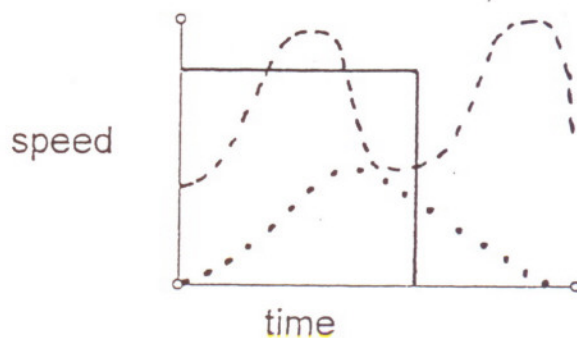
5. A yo-yo moving up and down, rhythmically.

a) — — — b) c) ———

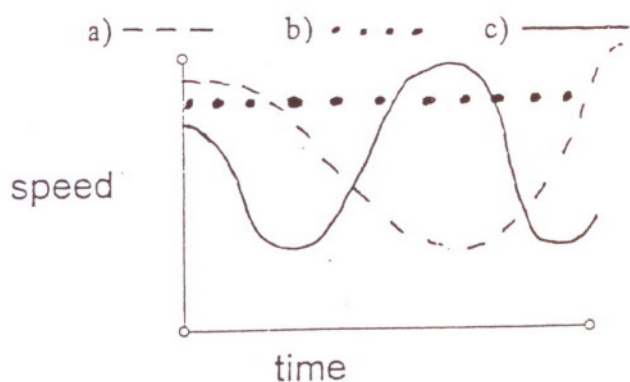


6. A wagon is given a push and coasts to a stop.

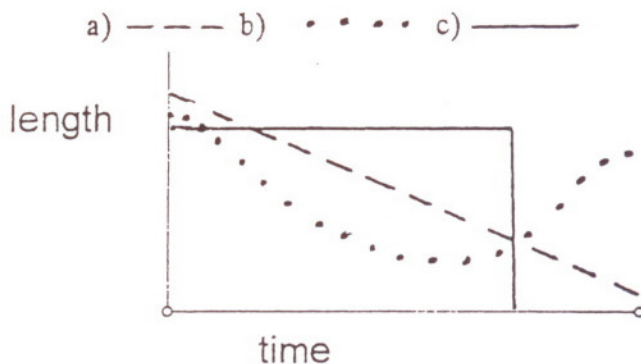
a) — — — b) c) ———



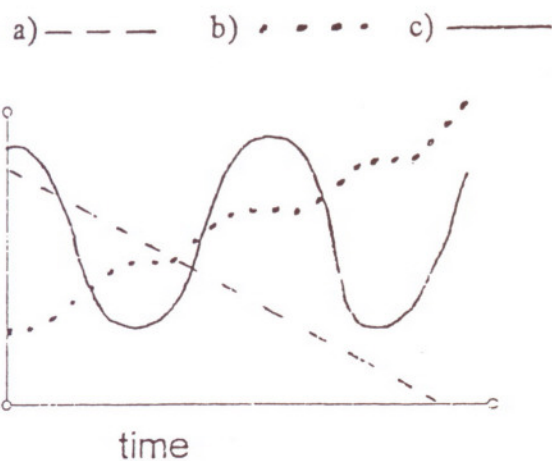
7. An airplane circling at a constant speed.



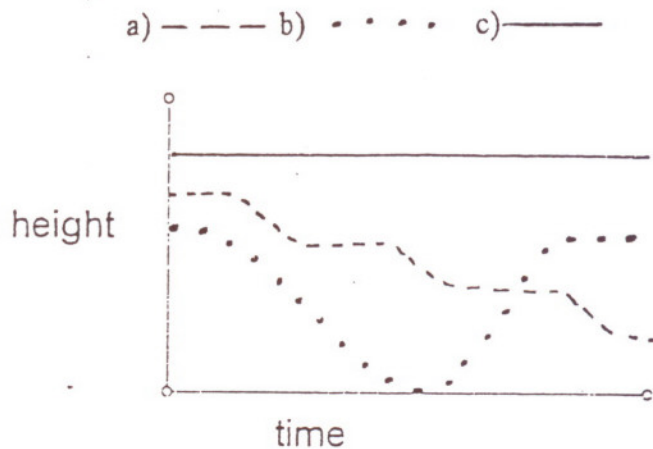
8. A burning candle.



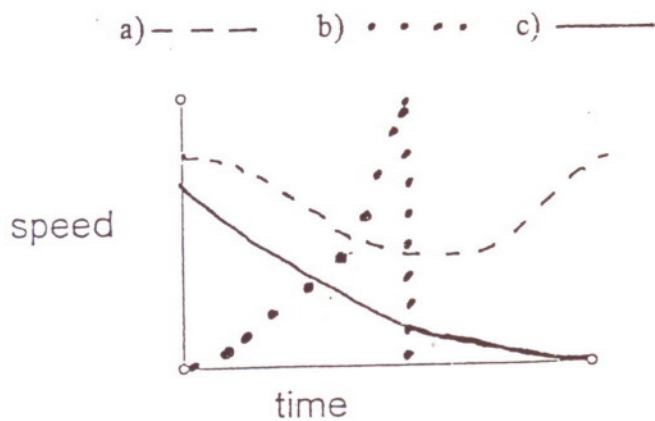
9. Growth of a tree over several years.



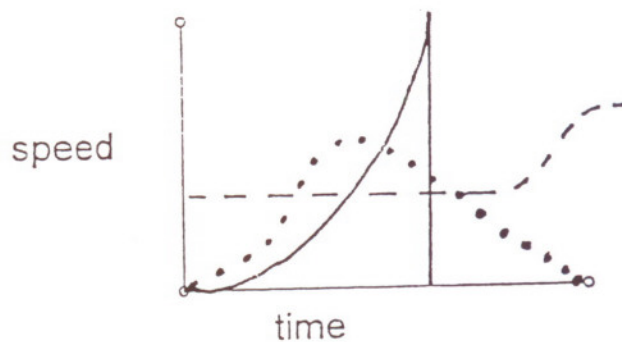
10. Sand castle being washed away by the waves.



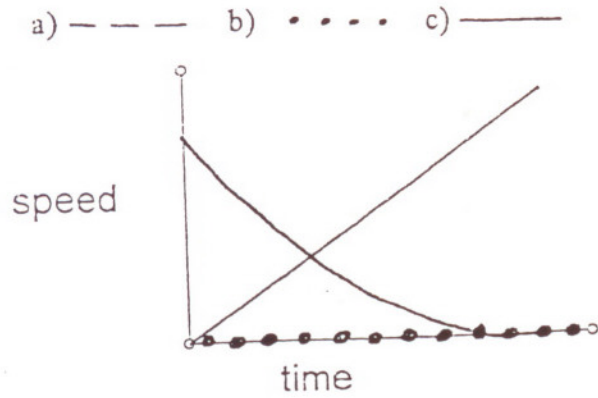
11. A wagon rolls down a hill into a tree.



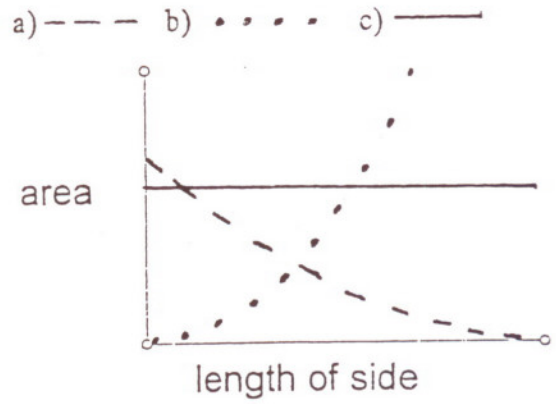
12. You bicycle up a steep hill and down the other side.



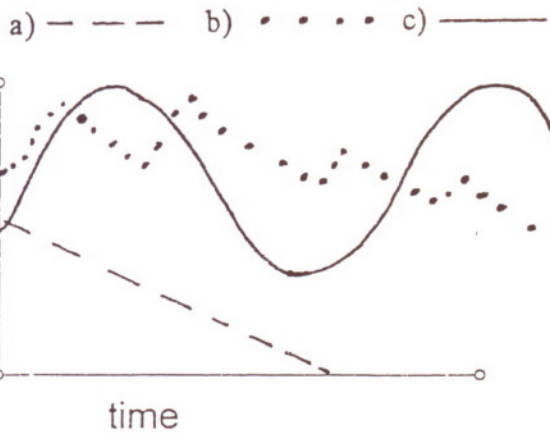
13. A dog sleeping in the sun.



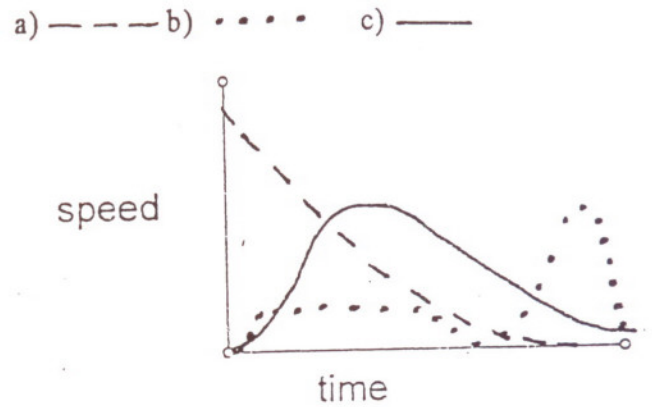
14. The area of a square.



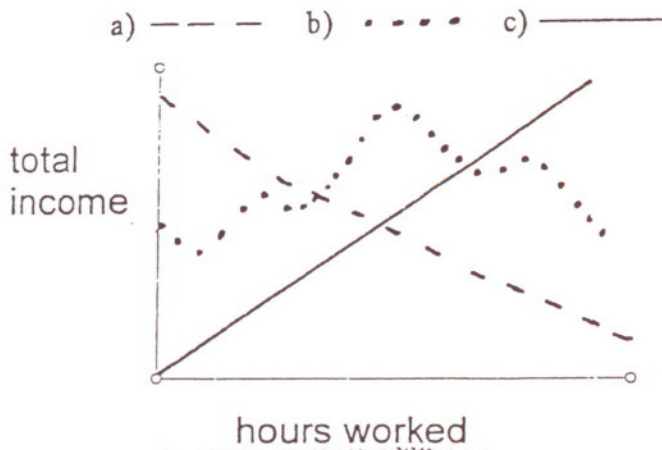
15. A seat on a Ferris wheel.



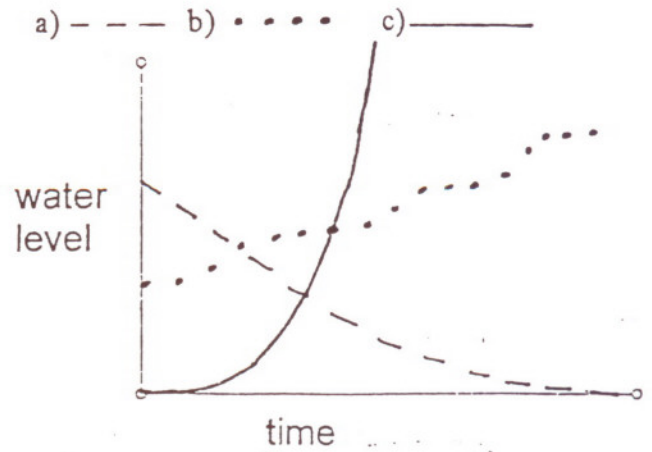
16. Climbing a hill and sledding down.



17. Income from a job with an hourly wage.

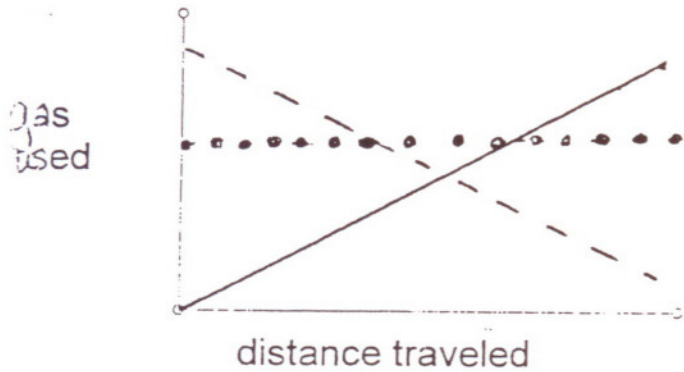


18. Water draining from a bathtub.



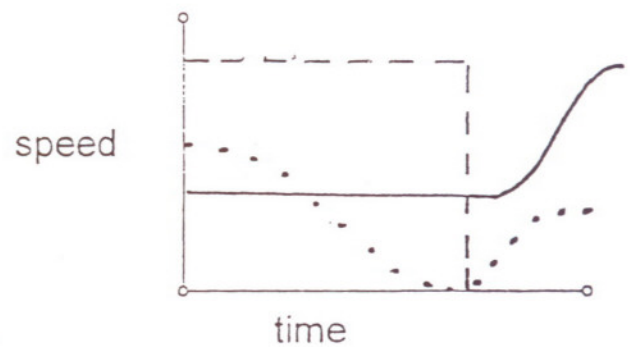
19. Gasoline used during travel on flat land.

a) - - - - b) c) ———



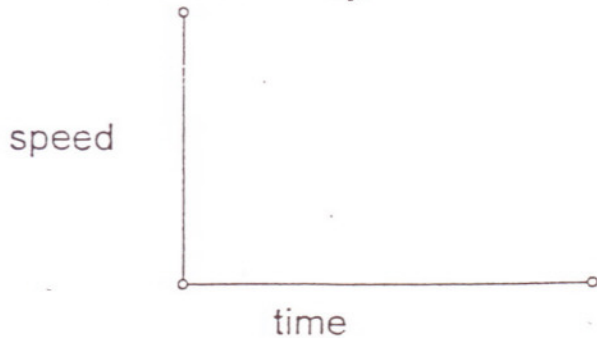
20. Speeding car crashing into a solid wall.

a) - - - - b) c) ———

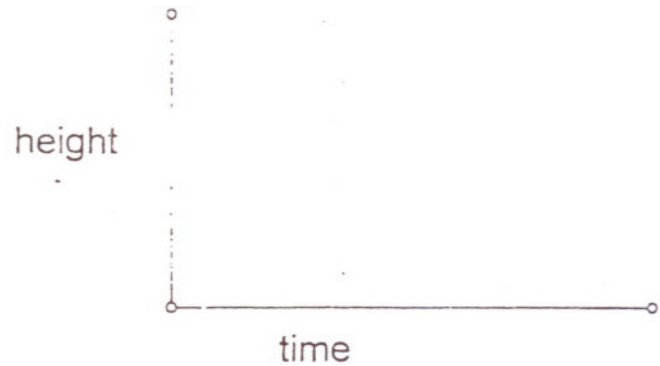


Now it's your turn. Draw a graph for each of the following.

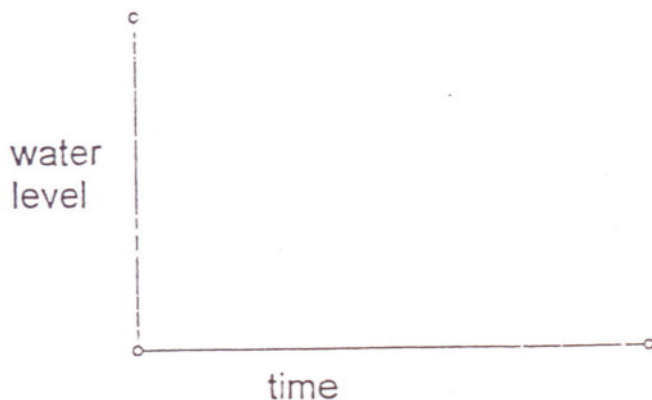
1. You drive through Atlanta, from Woodward to Gwinnett Place Mall at 4:00 PM on Friday.



2. A ride on the Viper at Six Flags.



3. Water level of the cooler during a football game.



4. A parachutist jumps from a plane at 8000 feet.



Determining Independent and Dependent Variables

Determine the dependent and independent variable for each. Circle the dependent variable and underline the independent variable. Then sketch a reasonable graph for each. Remember to label your axes.

1. The distance required to stop your car and how fast you are going.

2. The altitude of a punted football and the number of seconds since it was kicked.

3. Dan Druff's age and the number of hairs on his head.

4. Your age and your height.

5. The price you pay for a pizza and the diameter of the pizza.

6. The time of sunset and the day of the year.

7. You turn on the hot water faucet. The number of seconds the water has been running and the temperature of the water.

8. The weight of a package and the amount of postage you put on it.

9. The number of breaths you breathe per minute and the number of minutes since you finished a race.

Determining Independent and Dependent Variables

10. The number of breaths you breathe into a balloon and the diameter of the balloon.

15. Your feelings for your date and the number of times you change clothes before the date.

11. The number of letters in the corner mailbox and the time of day.

16. How many times you look in the mirror and how positive you feel about your hair today.

12. The cents you pay for a long distance call and the number of minutes you talk.

17. The amount of stress you feel about a test and the number of potato chips you down while studying.

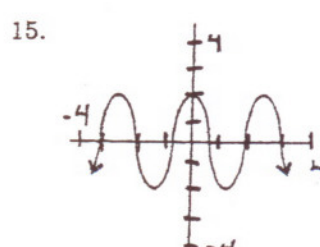
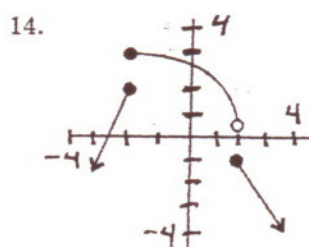
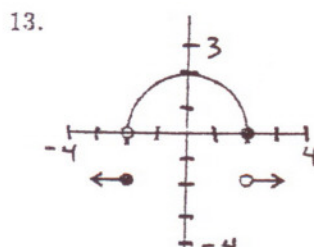
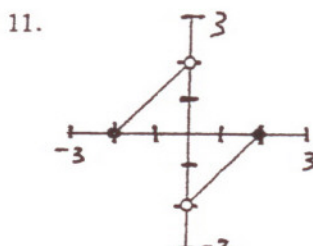
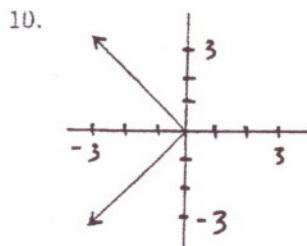
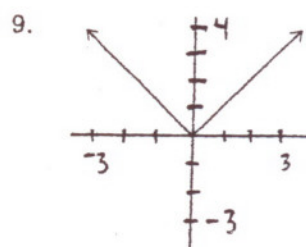
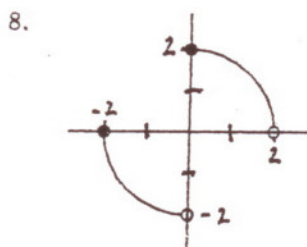
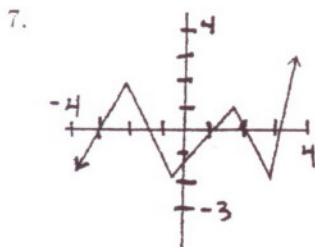
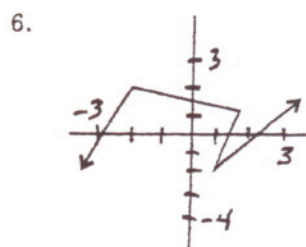
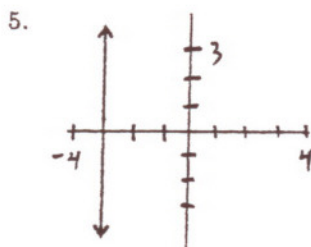
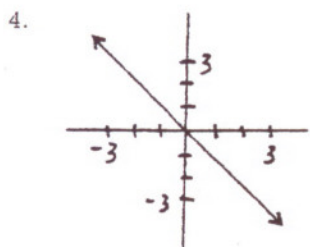
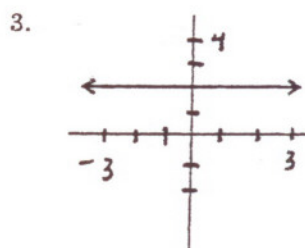
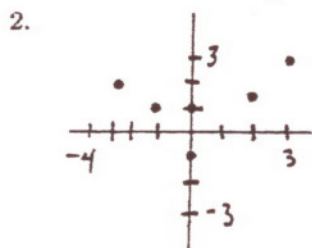
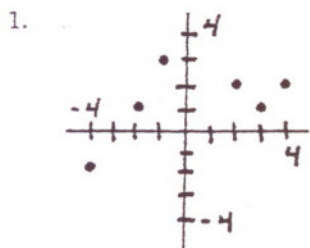
13. The hour of the evening and your efficiency at studying algebra.

18. Make up one or two of your own!!

14. Your feelings for your date and the number of stupid jokes he/she tells.

Chapter 2: Domain, Range, and Function Notation

Find the domain and range for each graph below. If the graph represents a function,



Each problem below corresponds to the graph above with the same number. If you are given the value of $f(x)$, find all x where this is true.

1. $f(-2) = \underline{\hspace{2cm}}$
 $f(x) = 2, \underline{\hspace{2cm}}$

2. $f(0) = \underline{\hspace{2cm}}$
 $f(x) = -1, \underline{\hspace{2cm}}$

3. $f(5) = \underline{\hspace{2cm}}$
 $f(x) = 0, \underline{\hspace{2cm}}$

6. $f(1) = \underline{\hspace{2cm}}$

8. $f(0) = \underline{\hspace{2cm}}$
 $f(x) = 0, \underline{\hspace{2cm}}$

9. $f(1) = \underline{\hspace{2cm}}$
 $f(x) = -1, \underline{\hspace{2cm}}$

10. $f(-1) = \underline{\hspace{2cm}}$
 $f(x) = -2, \underline{\hspace{2cm}}$

11. $f(0) = \underline{\hspace{2cm}}$ $f(-1) = \underline{\hspace{2cm}}$
 $f(x) = 0, \underline{\hspace{2cm}}$

FuNcTiOn JuNcTiOn

Name: _____

Decide if the information given below represents a function. If it does NOT represent a function, explain why.

1. $\{(3,2), (4, 3), (7,6), (8,6), (9,2)\}$ _____

2. $y = 2x^2$ _____

3. $\{(1,5), (3, 4), (1, -2), (-1, 4)\}$ _____

4. $y < 3x - 1$ _____

5. $2x - 2y = 6$ _____

6. $y^2 = x$ _____

7. $y = |x - 2|$ _____

8. $\{(-4, 5), (5, -4), (3, -2), (-3, 2)\}$ _____

9. $x = 3$ _____


10. $y = 2x^2$ _____

11. $x = 2y^2$ _____

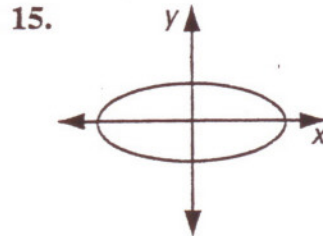
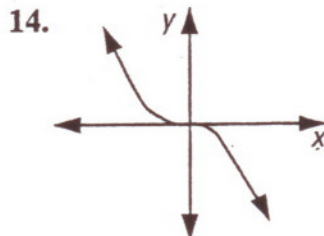
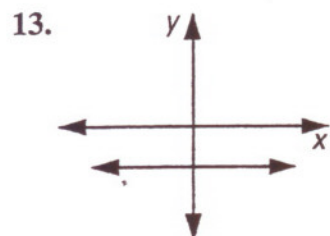
12. (a) Give an example of a relation that is NOT a function. _____

(remember, a relation is a set of ordered pairs. Like in # 1,3, or 8 above)

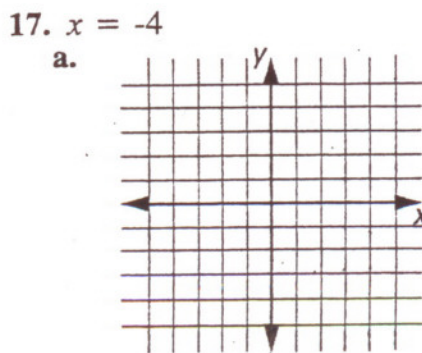
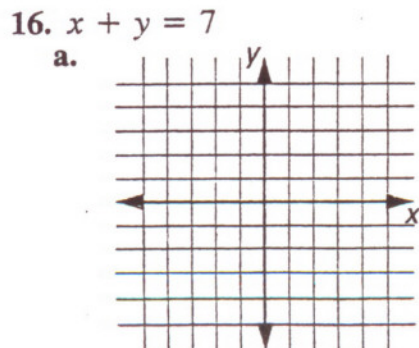
(b) Give an example of an equation that is NOT a function. _____

(c) Give an example of a graph that is NOT a function: 

In 13–15, tell if the graph represents a function.



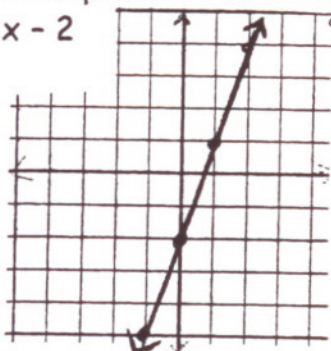
In 16 and 17, a. graph the equation, and b. tell if the equation describes a function.



Function Notation & Domain and Range

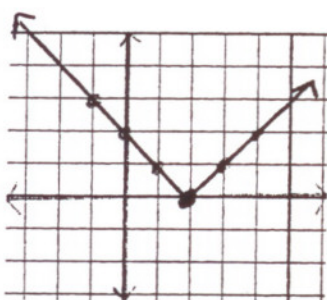
For each of the following functions, I have provided an equation and a graph. Use the information provided to answer each question.

1. $y = 3x - 2$



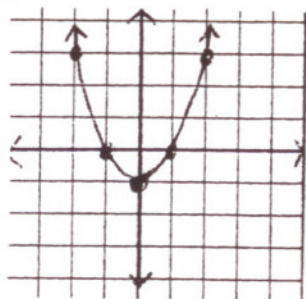
- write the equation in function notation: _____
- State the Domain: _____
- State the Range: _____
- Find each of the following function values: $f(1) = \underline{\hspace{2cm}}$
 $f(0) = \underline{\hspace{2cm}}$
- What input (x-value) produces the function value of 4? $\underline{\hspace{2cm}}$

2. $y = |x - 2|$



- write the equation in function notation: _____
- State the Domain: _____
- State the Range: _____
- Find each of the following function values: $f(2) = \underline{\hspace{2cm}}$
 $f(-1) = \underline{\hspace{2cm}}$
- what inputs produces the function value of 2? $\underline{\hspace{2cm}}$

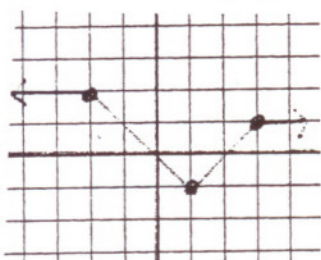
3. $y = x^2 - 1$



- write the equation in function notation: _____
- State the Domain: _____
- State the Range: _____
- Find each of the following function values: $f(1) = \underline{\hspace{2cm}}$
 $f(0) = \underline{\hspace{2cm}}$
- what inputs produces the function value of 3? $\underline{\hspace{2cm}}$

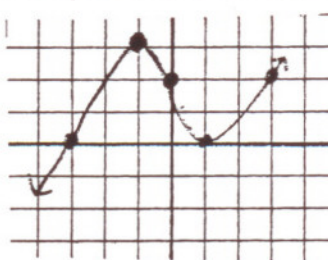
Given the following graphs, answer the questions below.

4.



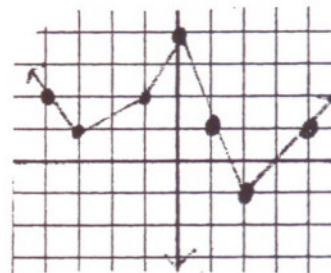
- Domain: _____
- Range: _____
- $f(3) = \underline{\hspace{2cm}}$
- where is $f(x) = 2$? $\underline{\hspace{2cm}}$

5.



- Domain: _____
- Range: _____
- $f(0) = \underline{\hspace{2cm}}$
- where is $f(x) = 0$? $\underline{\hspace{2cm}}$

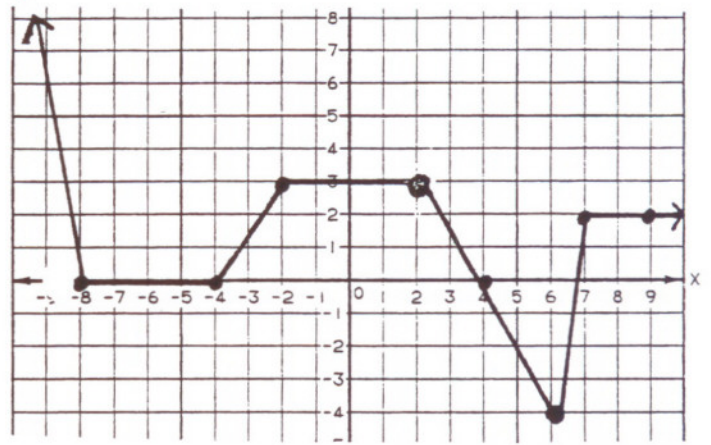
6.



- Domain: _____
- Range: _____
- $f(-1) = \underline{\hspace{2cm}}$
- where is $f(x) = 1$? $\underline{\hspace{2cm}}$

Are we having FUNctions yet???

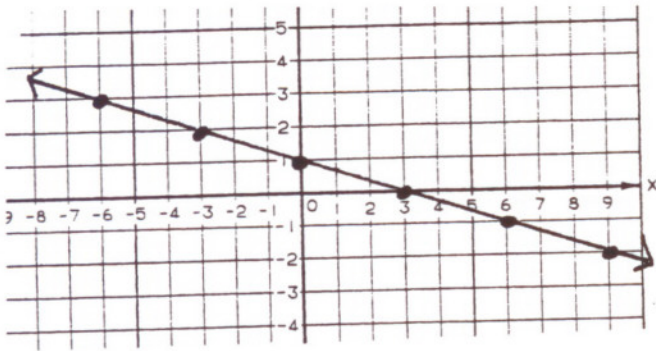
2)



D: _____ R: _____

$f(-2) = \underline{\hspace{2cm}}$ $f(6) = \underline{\hspace{2cm}}$

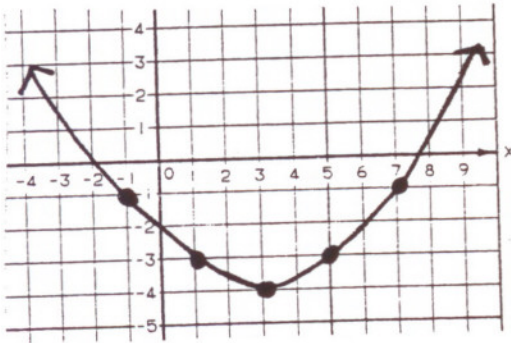
1)



D: _____ R: _____

$f(3) = \underline{\hspace{2cm}}$ $f(-6) = \underline{\hspace{2cm}}$

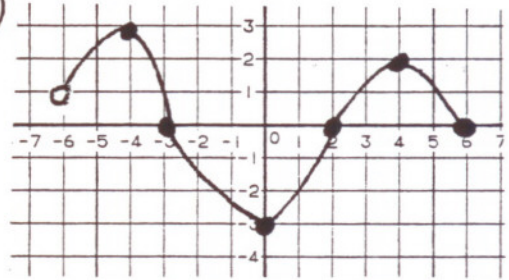
3)



D: _____ R: _____

$f(0) = \underline{\hspace{2cm}}$ $f(x) = 4$ so $x = \underline{\hspace{2cm}}$

4)



D: _____ R: _____

$f(x) = -3$ so $x = \underline{\hspace{2cm}}$ $f(6) = \underline{\hspace{2cm}}$

Graph each of the following functions on your calculator. Then state the domain and range of the function.

5. $y = \sqrt{x}$

6. $y = \frac{1}{x^2}$

7. $y = 3x^2 - 2$

8. $y = 3x + 1$

D: _____

D: _____

D: _____

D: _____

R: _____

R: _____

R: _____

R: _____

$f(9) = \underline{\hspace{2cm}}$

$f(-2) = \underline{\hspace{2cm}}$

$f(0) = \underline{\hspace{2cm}}$

$f(5) = \underline{\hspace{2cm}}$

$f(0) = \underline{\hspace{2cm}}$

$f(4) = \underline{\hspace{2cm}}$

$f(-1) = \underline{\hspace{2cm}}$

$f(x) = 2$ so $x = \underline{\hspace{2cm}}$